REMARKS

In response to the Office Action mailed October 28, 2004, Applicants respectfully request reconsideration. Claims 1-6, 9-17, and 20-27 were previously pending in this application. Claims 1, 6, and 17 have been amended. As a result, claims 1-6, 9-17, and 20-27 are pending for examination with claims 1, 6, and 17 being independent. The application as presented is believed to be in condition for allowance.

Claim Objections

The Office Action objects to claim 6 for containing redundant limitations. Claim 6 has been amended to eliminate the redundant limitation. Accordingly withdrawal of the objection of claim 6 is respectfully requested.

Rejections under 35 U.S.C. §112

The Office Action rejects claims 1-6, 9-17, and 20-27 under 35 U.S.C. §112 for failing to comply with the written description requirement and for being indefinite for failing to particularly point out and distinctly claim the subject matter.

Claims 6 and 17 have been amended to eliminate the word "essentially". Claim 1 has been amended to comply with the written description.

Accordingly, withdrawal of the rejection of claims 1-6, 9-17, and 20-27 under 35 U.S.C. §112 is respectfully requested.

It should be appreciated that the amendments to claims 1, 6, and 17 are made solely for the purpose of clarification and do not narrow the scope of the claims. Thus, these amendments raise no new issues that would require further search and/or consideration.

Rejections Under 35 U.S.C. §103

The Office Action rejects claims 1, 4, 6, 11, 12, 14, 15, 17, 22, and 23 under 35 U.S.C. §103(a) as being purportedly unpatentable over Ho et al., U.S. Patent No. 5,317,596 (Ho) in view of the Admitted Prior Art (APA) described in the present specification on page 3 lines 1-18.

The Office Action asserts that Ho describes a digital subscriber line transmission system comprising an inverse fast Fourier transform circuit generating successive outgoing time domain symbols on a subscriber line from respective groups of digital frequency domain coefficients, a fast Fourier transform circuit generating groups of digital frequency domain coefficients from respective incoming time domain symbols received on the subscriber line for incoming symbols, a current incoming symbol being delayed with respect to a current outgoing symbol by a predetermined time interval, and means for subtracting from a signal received on the subscriber line an estimated echo obtained using a filter from a signal portion following the end of the current outgoing symbol, and a beginning portion of the current outgoing symbol, wherein said portions have a duration at least equal to said predetermined time interval. The Office Action concedes Ho does not teach a circuit for making a local echo orthogonal. The Office Action asserts the APA discloses a method wherein circuitry is used to make echo signals orthogonal. The Office Action also asserts it would have been obvious to one skilled in the art to implement the teachings of the APA with the teachings of Ho since the APA teaches if echo signals are not orthogonal, the discontinuities which have a wide spectrum will occur and affect all the nearby channels. Applicants respectfully disagree.

Discussion of Cited References:

Ho illustrates a method to provide an improved echo canceller that accurately estimates and *eliminates* unwanted echo present in full-duplex data communication channels (Col. 4, lines 1-6). In figure 4 (relied upon by the Office Action) Ho describes a multicarrier transceiver system including a detailed block diagram of an echo canceller 100. A Frequency Domain Echo Canceller 110 stores a set of N frequency-domain echo parameters P(f), which are initially estimated by means of a fast start up technique. A Tail Cancellation and Cyclic Reconstruction block 150 stores a set of M time-domain echo parameters p(n), which are initialized by performing an inverse fast Fourier transform on the initial frequency-domain echo parameters P(f) (Col. 6, lines 34-49). The set of echo parameters P(f) is later block-multiplied to produce a frequency-domain echo E(f) (Col. 7, lines 5-9). With the use of a short time-domain linear convolution, a time-domain echo e(n) may be obtained with the use of the time-domain echo

parameters p(n) (Col. 7, lines 25-44). An adder 52 (figure 3) is used to subtract the time-domain portion of the echo e(n) from a time-domain signal received on line 40. The time-domain signal is then passed through FFT 56 and is converted to the frequency domain. The frequency-domain portion of the echo E(f) is then subtracted by adder 58, thus resulting in an *echo free* signal in receiver 60 (Col. 6, lines 10-21).

The APA illustrates a method of using cyclic suffixes to eliminate the problem of discontinuities caused by the sampling of the transitions between the outgoing symbols in the echoes (page 3, lines 1-4). Figure 4 depicts a stream of outgoing symbols (OUT) and a stream of incoming symbols (IN), wherein the OUT symbols convey a subcarrier f1 and the IN symbols convey a subcarrier f2 (page 2, lines 23-26). When each IN is sampled, the echo of an OUT symbol is also sampled due to a delay between the IN and OUT symbols. Transitions between OUT symbols are also sampled which cause discontinuities which have a wide spectrum (figure 2, page 2, line 29 – page 3, line 5). The APA describes a solution to the discontinuity problem as making the sampled echo orthogonal (page 3, lines 15-16).

The Combination of Ho and the APA is Improper:

Ho does not teach or suggest a discontinuity problem caused by transitions between outgoing symbols. Ho instead teaches a method of completely eliminating the echo from a signal and is therefore aimed at producing an *echo free* signal (Col. 6, lines 10-21). The system described by Ho would not have the discontinuity issues discussed in the APA, since Ho teaches completely eliminating the echoes. The APA, as described above, makes a sampled echo orthogonal, therefore the teachings of the APA *would not be feasible* if the echoes were to be canceled. Applicants assert no one of skill in the art would be motivated to make echoes orthogonal in a system in which the main purpose is to eliminate echoes. Applicants further assert such a combination would not be feasible since the combination would require making nonexistent echoes orthogonal. Therefore, the combination of the teachings of the APA with the teachings of Ho, in order to eliminate discontinuities caused by non-orthogonal symbols, is improper.

Applicants assert the Office Action has not made a proper *prima facie* case of obviousness. Therefore there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary sill in the art, to combine the reference teachings as required by MPEP §2143.

Applicants respectfully assert that the claims patentably distinguish over the combination of references since such a combination is improper. Accordingly, withdrawal of the rejection under 35 U.S.C. §103 is respectfully requested.
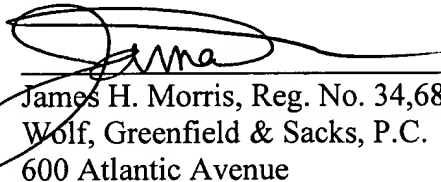
CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,
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